

And this I find generally in most *Metalline* colours, that though they consist of parts so exceedingly small, yet are they very deeply ting'd, they being so ponderous, and having such a multitude of terrestrial particles throng'd into a little room; so that 'tis difficult to find any particle transparent or resembling a pretious stone, though not impossible; for I have observ'd divers such shining and resplendent colours intermixt with the particles of *Cinnaber*, both natural and artificial, before it hath been ground and broken or flaw'd into *Vermilion*: As I have also in *Orpiment*, *Red-lead*, and *Bisè*, which makes me suppose, that those *metalline* colours are by grinding, not onely broken and separated actually into smaller pieces, but that they are also flaw'd and brus'd, whence they, for the most part, become *opacous*, like flaw'd Crystal or Glass, &c. But for *Smalts*, and *verditures*, I have been able with a *Microscope* to perceive their particles very many of them transparent.

Now, that the others also may be transparent, though they do not appear so to the *Microscope*, may be made probable by this Experiment: that if you take *ammel* that is almost *opacous*, and grind it very well on a *Porphyry*, or *Serpentine*, the small particles will by reason of their flaws, appear perfectly *opacous*; and that 'tis the flaws that produce this *opacousness*, may be argued from this, that particles of the same *Ammel* much thicker if unflaw'd will appear somewhat transparent even to the eye; and from this also, that the most transparent and clear Crystal, if heated in the fire, and then suddenly quenched, so that it be all over flaw'd, will appear *opacous* and white.

And that the particles of *Metalline* colours are transparent, may be argued yet further from this, that the *Crytals*, or *Vitriols* of all Metals, are transparent, which since they consist of *metalline* as well as *saline* particles, those *metalline* ones must be transparent, which is yet further confirm'd from this, that they have for the most part, appropriate colours; so the *vitriol* of Gold is Yellow; of Copper, Blue, and sometimes Green; of Iron, green; of Tinn and Lead, a pale White; of Silver, a pale Blue, &c.

And next, the *Solution* of all Metals into *menstruums* are much the same with the *Vitriols*, or *Crytals*. It seems therefore very probable, that those colours which are made by the *precipitation* of those particles out of the *menstruums* by transparent *precipitating* liquors should be transparent also. Thus Gold *precipitates* with *oyl of Tartar*, or *spirit of Urine* into a brown Yellow. Copper with *spirit of Urine* into a Mucous blue, which retains its transparency. A solution of sublimatè (as the same illustrious Authour I lately mention'd shews in his 40. Experiment) *precipitates* with *oyl of Tartar per deliquium*, into an Orange colour'd *precipitate*; nor is it less probable, that the *calcination* of those *Vitriols* by the fire, should have their particles transparent: Thus *saccarum Saturni*, or the *Vitriol of Lead* by *calcination* becomes a deep Orange-colour'd *minium*, which is a kind of *precipitation* by some Salt which proceeds from the fire; common *Vitriol calcin'd*, yields a deep Brown Red, &c.

A third Argument, that the particles of Metals are transparent, is, that being *calcin'd*, and melted with Glass, they tinge the Glass with transpa-

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rent colours. Thus the *Calx* of Silver tinges the Glass on which it is *anneal'd* with a lovely Yellow, or Gold colour, &c.

And that the parts of Metals are transparent, may be farther argued from the transparency of Leaf-gold, which held against the light, both to the naked eye, and the *Microscope*, exhibits a deep Green. And though I have never seen the other Metals *laminated* so thin, that I was able to perceive them transparent, yet, for Copper and Brass, if we had the same conveniency for *laminating* them, as we have for Gold, we might, perhaps, through such plates or leaves, find very differing degrees of Blue, or Green; for it seems very probable, that those Rays that rebound from them ting'd, with a deep Yellow, or pale Red, as from Copper, or with a pale Yellow, as from Brass, have pass'd through them; for I cannot conceive how by reflection alone those Rays can receive a tincture, taking any *Hypothesis* extant.

So that we see there may a sufficient reason be drawn from these instances, why those colours which we are unable to *dilute* to the palest Yellow, or Blue, or Green, are not therefore to be concluded not to be a deeper degree of them; for supposing we had a great company of small *Globular* essence Bottles, or round Glass bubbles, about the bigness of a Walnut, fill'd each of them with a very deep mixture of Saffron, and that every one of them did appear of a deep Scarlet colour, and all of them together did exhibit at a distance, a deep dy'd Scarlet body. It does not follow, because after we have come nearer to this *congeries*, or mass, and divided it into its parts, and examining each of its parts severally or apart, we find them to have much the same colour with the whole mass; it does not, I say, therefore follow, that if we could break those *Globules* smaller, or any other ways come to see a smaller or thinner parcel of the ting'd liquor that fill'd those bubbles, that that ting'd liquor must always appear Red, or of a Scarlet hue, since if Experiment be made, the quite contrary will ensue; for it is capable of being *diluted* into the palest Yellow.

Now, that I might avoid all the Objections of this kind, by exhibiting an Experiment that might by ocular proof convince those whom other reasons would not prevail with, I provided me a *Prismatical Glass*, made hollow, just in the form of a Wedge, such as is represented in the tenth Figure of the sixth *Scheme*. The two *parallelogram* sides A B C D, A B E F, which met at a point, were made of the clearest Looking-glass plates well ground and polish'd that I could get; these were joyn'd with hard cement to the *triangular* sides, B C E, A D F, which were of Wood; the *Parallelogram* base B C E F, likewise was of Wood joyn'd on to the rest with hard cement, and the whole *Prismatical* Box was exactly stop't every where, but onely a little hole near the base was left, whereby the Vessel could be fill'd with any liquor, or emptied again at pleasure.

One of these Boxes (for I had two of them) I fill'd with a pretty deep tincture of *Aloes*, drawn onely with fair Water, and then stop't the hole with a piece of Wax, then, by holding this Wedge against the Light, and looking through it, it was obvious enough to see the tincture of the liquor near the edge of the Wedge where it was but very thin, to be a pale but

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